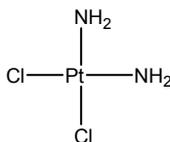


**CISPLATIN**  
**CAS No. 15663-27-1**

First Listed in the *Fifth Annual Report on Carcinogens*



## CARCINOGENICITY

Cisplatin is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals. When administered as multiple intraperitoneal injections, cisplatin significantly increased the incidence and number of lung adenomas in female mice. Similar treatments caused a significant increase in the incidence of skin papillomas in female mice given promoting treatment of croton oil applied to the skin. In two studies, when administered by multiple intraperitoneal injections, cisplatin induced leukemia in rats of both sexes (IARC 1981, 1987).

No adequate data were available to evaluate the carcinogenicity of cisplatin in humans. Occasional case reports of exposure to cisplatin, especially in the presence of concurrent therapy with other putative carcinogens, such as ionizing radiation, alkylating agents, and other potent oncotherapeutic drugs, do not constitute evidence of carcinogenesis (IARC 1981, 1987).

## PROPERTIES

Cisplatin is a yellow crystalline solid that is slightly soluble in cold water and insoluble in most common solvents except *N,N*-dimethylformamide. In aqueous solution, cisplatin slowly changes to the *trans* form. It decomposes at approximately 270°C. When heated to decomposition, cisplatin emits very toxic fumes of chlorine and nitrogen oxides (HSDB 2000).

## USE

Cisplatin is an experimental carcinogen (Sax and Lewis 1987). It is used for the treatment of various malignancies, often in combination with other antineoplastic agents (IARC 1981, Goodman and Gilman 1996). Since the 1970s, cisplatin has been used in the treatment of testicular tumors; malignant melanoma; osteogenic sarcoma; carcinomas of the urinary bladder, lung (other than small cell), uterine cervix, and ovary; and squamous carcinoma of the head and neck region (IARC 1981).

## PRODUCTION

Preparation of cisplatin was reported in the 1840s (IARC 1981). There has been at least one producer of cisplatin since 1986; however, production volumes have not been disclosed (SRI 1997, USITC 1989-1991, 1993-1995). *Chemycyclopedia 98* and the 1998 Chemical Buyers Directory identified three and six domestic suppliers of the chemical, respectively (Rodnan 1997, Tilton 1997). Chem Sources (2001) listed 12 suppliers in the United States.

## EXPOSURE

The National Occupational Exposure Survey (1981-1983) estimated that 21,217 total workers, including 15,288 women, potentially were exposed to cisplatin (NIOSH 1984).

Cisplatin is a relatively new anticancer agent used in human medicine to treat a variety of malignancies (Searle 1984). Since the compound is packaged as a powder, not only are patients exposed, but potential exposure exists for medical and pharmacy personnel, the pharmaceutical manufacturers, and hospital and clinic housekeeping personnel via skin absorption during production or inhalation during preparation of dosage forms (IARC 1981, HSDB 2000).

## REGULATIONS

The ACGIH recommends a threshold limit value (TLV) for an 8-hr time-weighted average (TWA) of 0.002 mg/m<sup>3</sup> as platinum for soluble platinum salts (ACGIH 1999). OSHA regulates cisplatin under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table 47.

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